GOVERNMENT OF ANDHRA PRADESH
A B S T R A C T

Energy, I & I Dept. - Selection of Agency for Design, Implementation and Management of Free Space Optical Communication (FSOC) Solution in AP Fiber Network – Orders – Issued.

ENERGY, INFRASTRUCTURE AND INVESTMENT (AIRPORTS) DEPARTMENT

G.O.MS.No. 37 **Dated: 06-12-2017**
Read :

1) From the Managing Director, APSFL, Vijayawada, Lr.No.APSFL/FSOC/204/2017, dated 16.11.2017.

******

O R D E R:

The Managing Director, APSFL in the reference read above has informed that the proposed Free Space Optical Communication (FSOC) Solution is a unique technology with superior data transmission capabilities of 20Gbps upto a range of 20Kms with a latency of 100ms. It works effectively even in extreme weather conditions of Humidity of 5% to 100% and temperature range of -10°C to +60°C.

2. The Managing Director, APSFL has further informed that APSFL has floated Expression of Interest (EoI) which has the pre-qualification criteria in order to identify eligible firms for the envisaged FSOC solution. In response to the EOI, only one bid was received from M/s. Google X, R&D division of Google Inc. who are pioneers in providing latest technological inventions especially FSOC solution.

3. APSFL has released RFQ (Request for Quotation) document to the pre-qualified bidders which contains critical sections viz., Terms & Conditions, Solution, Scope, Selection Criteria, Timelines & Payment Terms, Financial Quote, etc. The APSFL and M/s PwC, the Retainer Consultants to APSFL have conducted detailed assessment of the RFQ response submitted, and raised several clarifications in line with RFQ released. After several iterative responses to the clarifications sought by APSFL, the proposal submitted by M/s Google Inc. has been accepted. However, in the revised response, the agency has requested the following modifications:

a) To consider the performance bank guarantee (PBG) in lieu of Earnest Money Deposit (EMD).
b) To exempt, from the scope of work, the last mile connectivity to the nearest POP from the FSOC link.
c) To consider the No. of pilot demonstrations to 5 locations instead of 10, as sought in RFQ.
d) To consider the Price bid in USD instead of INR as sought in RFQ.

4. The details of the project were placed before the "35th Technical Committee", consists of domain experts including two(2) outside experts on 06/11/2017 for validating the feasibility of the FSOC project both in technical and financial terms. The Committee after discussing the project details, has recommended that the project is viable.

5. APSFL chose to explore FSOC technology due to the inherent advantage it offers vis-a-vis Fiber/RF implementation. The biggest benefit of FSOC technology is in remote areas or areas which are subject to geographical obstacles, like rivers, mountains etc. In

such geographic areas, Fiber is infeasible and hence the section of people in these areas are deprived from the innumerable connectivity benefits that technology offers. Hence, FSOC, by virtue of not being dependent on such geographic obstacles is the only way to connect these remote areas with the internet. The following are the benefits of the project:

1. **Technical Benefits** : The Fiber has a much longer deployment time and is immovable in nature while FSOC is faster to deploy and is flexible to move. Also, FSOC offers higher reliability for point-to-point connectivity and is easy to integrate with other infrastructure components by virtue of open standards. Compared to Radio Frequency (RF), FSOC is much more cost-effective and provides excellent data transmission ranges over long range (20 Gbps up to 20 kms) which is not possible with Radio Frequency.

2. **Cost Benefits** : Considering Fiber laying cost of approx. 1 Lakh/km, the 20 kms range would equate to a cost of approx. INR 25.6 lakhs including taxes and maintenance, which is higher compared to the cost of implementing FSOC links which costs INR 18.8 lakhs all-inclusive for a 20 kms range.

3. **Social Benefits** FSOC helps expand the reach of service delivery, thereby improving the happiness index of the people of the state . Subsequently, FSOC will provide reliable high-speed Internet connectivity service to new commercial customers such as startups and enterprises setting up offices in AP with the least possible delay, so as to provide a positive business environment in AP and also effectively compete with private service providers in providing best possible customer service.

4. **Commercial Benefits** : In many rural locations, the 2G cell phone towers are connected to operator's network using microwave which is expensive and low bandwidth. By using FSOC, these towers can be connected to the nearest AP Fiber Grid Point of Presence (PoP). Currently, there are more than 1000 towers in AP that are only 2G. Considering the proposal of Google providing 2000 links, assuming that 50% of these links shall be used for connecting the unconnected areas and the rest 1000 links shall be utilised commercially to connect 1000 towers out of 10000+ 2G tower population in the state. The revenue per year from 2G tower up gradation shall be around 4 Lakhs/annum/Gig, at discounted price (the present discovered price offered for 1 Gig Layer2 Virtual Private Network(L2VPN) link is INR 7 Lakhs plus taxes). Further, leveraging the bandwidth strength of FSOC and using L2VPN facility, the same service can be provided to at least 2 vendors which will bring in additional revenues to the tune of 160 crores/annum.

6. The selected bidder shall install the 2000 FSOC links planned at the applicable site locations within a maximum time period of twelve (12) months from the date of receipt of Purchase Order. Warranty shall be for a period of one (1) year from the date of acceptance of link installation at the sites. In this regard, APSFL confirmed that the order for the 2000 links will only be placed post the successful pilot demonstration of 5 links.

7. As per the RFQ response received from M/s Google, the applicable prices for Products and Services will be invoiced in Indian Rupees ("INR") and the prices for the products and services shall be converted from USD to INR using the average of the closing exchange rates listed by the Wall Street Journal. In this regard, APSFL shall bear the additional cost due to exchange rate fluctuation (if any). The Financial Picture and Budget requirement project are detailed below:

A. Project Cost :

Sl. No	**Description**	**Unit Rate (A) USD**	**Import duties/ Taxes (I)**	**Qty (B)**	**Total (C)= (A+A*I)*B (USD)**	**Amount in INR* 1USD= 64.89 INR**
1	FSOC Link	$	30.15%	2,000	$	Rs.3,378,173,400

	(“ Link”)	20,000			52,060,000	
2	Installation/ commissioning which includes uninterrupted power Supply, network switch, electrical cabling, rack, lightning arrestor	$ 2,500	18%	2,000	$ 5,900,000	Rs.382,851,000
Subtotal					$ 57,960,000	Rs.3,761,024,400
Last mile connectivity charges** (to be done by AP Fiber)						Rs. 350,000,000
Total						Rs.4,111,024,400 or Rs.411.10 crores.

*Rates quoted are as per the 1 USD= 64.89 INR rate as on 30/10/2017.

** Considering avg of 5 km of 6F optical fiber connectivity required per link at a cost of Rs.35,000 per km.

B. Budget requirement

The FSOC project implementation is expected to be completed by December, 2018. As per the payment terms in the RFQ, 100% of the project cost will need to be paid to M/s Google by December, 2018. Warranty shall be for a period of 1 year from the date of installation of FSOC links at the specified location. Maintenance service shall be free of cost for the first year. AMC for 2nd and 3rd years will be chargeable at an annual rate of 10% of the CAPEX.

In this regard, 500 FSOC links shall be completed by March 2018 and the Rest 1500 by December, 2018. The budget requirement are as detailed below:

Sl.No	Financial Year	Amount in INR Crores
1	FY 2017-18	Rs.102.78 Crs
2	FY 2018-19	Rs.308.32 Crs

8. The Managing Director, , APSFL in the reference read above has sought approval from the Government on the following:

I. To consider the performance bank guarantee (PBG) in lieu of Earnest Money Deposit (EMD).
II. The last mile connectivity to the nearest PoP from the FSOC link to be done by AP Fiber at a cost of Rs.35 Crores.
III. To consider the number of pilot demonstrations to 5 locations instead of 10 as sought in RFQ and to consider the Price bid in USD instead of INR as sought in RFQ.
IV. To accept the financial offer of INR 376.10 crores (Three Hundred and Seventy-Six Crores Ten Lakhs only) for 2000 links inclusive of taxes and duties and a total approval for INR 411.10 Crores (Four Hundred and Eleven Crores Ten Lakhs only) (Rates quoted are as per the 1 USD= 64.89 INR rate as on 30/10/2017) including INR 35 Crores towards last mile connectivity charges; and
V. To Award of the Project to M/s Google Inc. or its subsidiaries /affiliates and signing of agreement as per RFQ Terms & Conditions.

9. Government after careful examination of the proposal of the Managing Director, APSFL, is hereby approve on the following:

a) Accord permission to consider the performance bank guarantee (PBG) in lieu of Earnest Money Deposit (EMD);

b) The last mile connectivity to the nearest Point of Presence (PoP) from the FSOC link to be done by AP Fiber at a cost of Rs 35 Crores;

c) Accord permission to consider the number of pilot demonstrations to 5 locations instead of 10 as sought in RFQ and to consider the Price bid in USD instead of INR

as sought in RFQ;

d) Accept the financial offer of INR 376.10 crores (Three Hundred and Seventy-Six Crores Ten Lakhs only) for 2000 links inclusive of taxes and duties and a total approval for INR 411.10 crores (Four Hundred and Eleven Crores Ten Lakhs only) (Rates quoted are as per the 1 USD=64.89 INR rate as on 30/10/2017) including INR 35 Crores towards last mile connectivity charges;

e) Accord permission to Award the Project to M/s Google Inc. or its subsidiaries/affiliates and signing of agreement as per RFQ Terms & Conditions only after successful completion of pilot project at 5 locations and acceptance by the technical committee; and

f) Provide Government Guarantee to APSFL for an amount of Rs.411.10 crores (Four Hundred and Eleven Crores Ten Lakhs only) subject to the following conditions:-
   (i) Servicing both the interest and debt from its resources;
   (ii) Payment of one time Guarantee commission of 2% of the loan amount as Government need to deposit in Guarantee Redemption fund.

10. The Managing Director, APSFL shall take further action in the matter.

11. This orders issued with the concurrence of Finance Dept., vide their U.O.No.22029/14/DM/2017, Dated 29.11.2017.

(BY ORDER AND IN THE NAME OF THE GOVERNOROF ANDHRA PRADESH)

AJAY JAIN
PRINCIPAL SECRETARY TO GOVERNMENT

To
The Managing Director, APSFL, Vijayawada.
Copy to:
P.S., to Prl. Secretary to C.M.
P.S., to Prl. Secretary, E, I&I Dept.
The P.S., to Secretary, IT & C Dept.
The Finance Dept.
The G.A. (Cabinet) Dept.
The Advisor, Realtime Governance, AP Fibre and A.P.Towers Limited.
SF/SC(W.r.t.C.No.17022/176/2017/Airports/E-I&I)

//FORWARDED BY ORDER//

SECTION OFFICER